



School of Construction
& Property Management

Teaching & Learning Quality Improvement Scheme

Guidelines for improving social outcomes gained through distance learning (DL) tools

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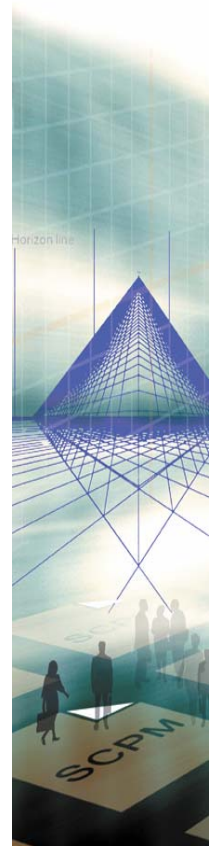


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Abbreviations

CMC – Computer Mediated Communication

DL – Distance Learning

SCPM – School of Construction and Property Management

About this report

This document represents the final report for *Guidelines for Improving social outcomes gained through distance Learning (DL) tools*, a research project led by the University of Salford's School of Construction and Property Management (SCPM). The project was funded through the Teaching and Learning Quality Improvement Scheme (TLQIS) and this report has been produced in partial fulfilment of the TLQIS scheme requirements. This report presents an overview of the project: the background and rationale; a summary of the activities undertaken, including initial interviews and a case study; the project aims and objectives; the research methodology and project evaluation; consideration of problems encountered and changes from the original proposal; and, reflection on the transferability of the project outcomes and final conclusions.

A set of good practice guidelines on using Distance Learning tools to improve social outcomes, based on the project's findings is available separately.

This final report has been written by the project's research team. If you require any further details concerning the project, please contact the principal investigators:

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1 Introduction and rationale

As demanded by the ever increasing social complexity attached with the recent globalisation trends, the need for time and geographical independent teaching and learning environments has become prominent, especially during the last decade of the 20th century. The attempt to address this requirement is largely through electronic communication tools backed up by the modern advancements in communication technologies. With the advent of the Internet Distance Learning (DL) was repositioned as a major tool for course delivery so that students can undertake learning within a setting of their choice aligned with a pace that they can easily cope with.

DL concept mainly originated with the founding of the Open University in UK in 1969 and the development of a mixed media approach to teaching (Hellman 2003). DL continues to expand because of the growth of the Internet, increased capability and flexibility of web based tools, increased proficiency in basic internet skills and shrinking barriers with respect to accessing and using the Internet (Lindner, 1999). Marketing of DL programs occupies the forefront of activities within many universities in the UK

With the increase of DL programmes being offered there has been a corresponding increase in mechanisms which are being developed to facilitate course delivery. Further, recent studies in the field have revealed the fact that significant number of tools have been developed to facilitate DL courses (Dede, 1996; Wilson and Whitelock, 1997). Also their ability to deliver overall learning outcomes has been dealt with to a certain extent by considering student perspectives (Wilson and Whitelock, 1997, 1998; Whatley and Bell, 2003). But, the degree to which these tools satisfying social aspects of a classroom setting (e.g. guidance and support, body language, feedback, interactions with other learners etc.,) has not received adequate consideration in existing literature [see Diaz and Carnal (1999) for a comparison of distance learning and a face-to-face classroom setting]. The importance of this has been pointed out by Whatley (2004) with the use of Kolb's (Kolb, 1984) stages of experiential learning (concrete experience, reflective observation, conceptualisation and active experimentation). According to Whatley (2004:55);

"Students undertaking online courses should be given a similar opportunity (Kolb's stages of experiential learning) to experience team working, but where face-to-face contact is not possible, technologies may be able to provide additional resources to make the online experience comparable"

A student satisfaction survey that School of Construction and Property Management (SCPM) in the University of Salford carried out also suggests that a significant number of DL students perceive a gap existing between their experiences compared with experiences of other students who attend class room based courses. This is reiterated by Whatley (2004) that online learners, who rely on Internet connections to communicate, often feel a 'sense of isolation' from the support of others. This research addressed this research problem of how this 'sense of isolation' is dealt with by appropriate interfacing of the social dimension with DL tools to improve the effectiveness and efficiency of the interactions between the DL facilitator and learners during online DL settings. The next section reviews the existing literature in the subject domain to identify the nature of this research question further along with an investigation about the up to date research status.

2 Literature Review

2.1 Evolution of Distance Learning theories

As Hellman (2003) pointed out, the concept of Distance Learning was originated with the establishment of the Open University in UK in 1969. This was further connected to the development of the mixed media approach to teaching. Further, the rapid growth of the internet related technologies and increased proficiency in basic skills in basic internet usage had also contributed to the continued expansion of Distance Learning. (Lindner, 1999).

Revealing the major milestones of the evolution of DL, Garrison (2000) conducted a detail literature review of the historical perspective of distance learning. According to this review, in early 70's the focus of the distance learning was shifted from 'correspondent study' focus towards an 'independent study' focus. Within the earlier focus the concentration was on the organisational and administrative issues where as the latter has focused on pedagogical assumptions on more educational issues related to the learning at a distance (Wedmeyer, 1971). These issues include elements such as communication, pacing, convenience and self determination of goals and activities. This focus shift shows that during its evolution, the distance learning has had alternating considerations about its hard and soft issues. However, it is not clear up to which extent either of these focuses interacts with the social issues of learning. Considering its origination and this focus shift, it is arguable that initially the distance learning might have been considered as outside to the traditional classroom based learning settings from the functional point of view. Due to this reason the importance of social aspect within distance learning environments might have been overlooked at early stages.

At later stages this separation became more visible as Holmberg (1989) brought in a different perspective by arguing that distance education is a friendly conversation fostered by instructional materials and it is the responsibility of course developers to create this simulated conversation through well-written materials. This definition, implies that distance learning is more of a self learning process (either correspondent study focus or independent study focus) as the role of the teacher is largely reduced to a set of written instructions. Accordingly these views might have overlooked the importance of social issues within these settings as oppose to more traditional classroom based learning environments. On the other hand, Moore (1990) considers that transactional distance is pedagogic and not geographic and need special organisations and teaching procedures. Further the structure and dialogue have been identified as major parameters that vary with the transactional distance. Within this view the most distant program has low dialogue and low structure while the least distant has high dialogue and high structure. Along with these two dimensions, Moore (1990) added the learner autonomy and teacher control as two extremes of another important continuum within distance learning. He defines autonomy of the learners as "the extent to which in a programme the learner determines objectives, implementation procedures and resources and evaluation (Moore, 1990: 13). The polarisation between the two extremes appears to conceptualise autonomy as less a function of personal responsibility and more a function of structure and the learning materials (Ingirige et al, 2005).

According to Garrison (2000), a sustained two way communication is the most important aspect of educational experience. This emphasises the fact that maximisation of learner's autonomy or teachers control will affect the educational experience negatively. Moreover, within this theory it is suggested that the shared control as a mean of minimising learner isolation. As a spin-off, the importance of continuous social aspect from the learner's perspective is stressed within this theory.

This view has further been enhanced during the early 90's. As an example, Henri (1992) provided his transaction based psychosocial model which specified the collaborative view of teaching and learning by coding the DL tools to enhance the nature and quality of the aspect. At this point it is very much visible from evolution of above theories that the social aspect has been identified as an important issue to be discussed within distance learning environments.

2.2 Role of Computer Mediated Communication (CMC) tools within Distance Learning Environments

As identified before, improving the transactional aspect of distance learning is one of the biggest current challenges. This is mainly due to the fact that organisational and administrative barriers of DL have become less complicated with the advances in computer mediated communications (CMC) and the Internet as a common meeting place for the tutors and learners (Ingirige et al, 2005). Thus, this section investigates two major DL settings to identify how those deal with the transactional and social aspects of DL by using CMC based tools. At the same time, it is also intended to identify the common features of CMC based DL tools in current use.

Recent research supports that CMC promotes autonomy and develops reflective skills as well as reduces feelings of isolation often experienced by distance learners (Lewis et al, 1997; Mason, 1998). A survey done by Rahm (2004) revealed that several computer based tools are heavily being relied upon within distance learning courses. This includes use of multi-person computer interactions such as chat rooms or listservs (20 percent of respondents reporting this activity), e-mail interaction with remote students (53 percent), as well as use of the Internet and the World Wide Web for class or program delivery (43 percent). Use of other technologies for delivery is minimal with 20 percent reporting the use of satellites and 16 percent the use of public television.

2.2.1 DL Course delivery modes

From the DL settings perspective there are two major modes of course delivery; synchronous and asynchronous. As a result, the CMC tools for DL can also be classified in to synchronous (using same time communications), asynchronous (communications that do not require participants to exchange information at the same time), one way (information delivered from one point to one or many other points), two-way (any communication in which the flow is bi-directional but not limited to synchronous), multi-point (information delivered simultaneously from one place to many other places) and multi-cast (usually consisting of transmission of a video or audio clip to the computers of many users) Carty (1999). There are different schools of thoughts regarding the suitability of various modes of course delivery based on the circumstances. The synchronous tools provide significant advantages over and above asynchronous modes, as the synchronous modes provide opportunities to have close interactions between the parties using modern technologies such as web conferencing. However, using 100% synchronous modes for DL is considered as unsuccessful specifically within construction education, due to various reasons such as the circumstances of the participants and the difficulties they face in too frequent virtual classes (Ingirige and Goulding, 2006). This study uses synchronous /asynchronous classification and the terminology when analysing the CMC based tools used within the institutes taken for empirical investigation.

2.2.2 Characteristics of CMC based Asynchronous DL tools

The initial literature review suggests that a lot of tools have been developed to facilitate DL courses (Dede, 1996; Wilson and Whitelock, 1997). Several CMC tools are packaged as DL tools for course delivery. 'Blackboard' is a very common tool used both for online course delivery as well as a portal for distribution of materials. As such

Blackboard is considered a Virtual Learning Environment (VLE) for DL. Hence, this section evaluates the characteristics of “Blackboard” in order to identify the main characteristics of a CMC based asynchronous DL tool.

Keraminiyage et al (2006) based on the study done by Barrett (2003) categorise the major functionalities of Blackboard as information services, communication services, assessment services and content management services. The information services are basically a set of supportive tools from an administrative perspective. This mainly includes an online announcement service where tutors can post announcements to be viewed by students. This facilitates the basic infrastructure desired to ensure smooth implementation of DL courses.

The communication services provide the infrastructure to create the two way communication between the learner and the tutor. Within this category, tools such as forums, text based chat services, collaborative tools (virtual class rooms) and email facilities (individual and mass) exist. However, taking the social aspects of traditional learning environment into consideration, the DL environment lacks some of the essential communication aspects compared to a physical face-to-face classroom session. For an example, as Keraminiyage et al (2005) highlighted, despite the fact that the informal private exchange of ideas between learners is a major mode of initiating social interaction, the DL setting hardly provides any support towards initiating co-learner interaction.

Assessment services are designed to be used by the tutors to assess the students. This service includes tools such as online multiple choice questions, questionnaires, surveys and offline file submissions. Further, the tools such as “grade book” and “performance dashboard” are integrated to this service to help the tutor with the administrative tasks of assignments.

Keraminiyage et al (2006) point out an important social issue related to these assignment services compared that to a traditional classroom based assignment setting. As they pointed out, the close book examinations are the major mode of student assessment within a classroom based learning environment. However, within a DL setting, the actual effectiveness of this system is in question as students cannot be monitored closely during the assessment time. Keraminiyage et al (2006) further indicate a solution to this problem, by suggesting the assignments be made accessible only within specific time periods, within dedicated examination centres. They further point out the practice of examinations conducted by Microsoft for their Certification Examinations (MSCE, etc) as a good practice example.

Content management services mainly comprise of a file repository, where tutors can host lessons related information, such as lecture notes, presentations, etc. At the same time, the students may use tools such as “digital drop box” within this service to submit assignments to tutors.

In addition to the Blackboard; WebCT, moodle, Sakai and Bodington can be highlighted as few other CMC based asynchronous DL tools which share similar set of services and characteristics.

2.2.3 Characteristics of CMC based synchronous DL tools

Mode of communication is a key consideration within current DL settings. In a traditional learning environment, multi modes of communication are available between the tutor and the learner. The major modes of communication are verbal (talking), visual (body language, visual presentations such as posters or computer based presentations) and text based communication (traditional blackboard or whiteboard based). The CMC based asynchronous tools discussed above mainly operates based on a text based communication mode. Often all the other modes on communications are supported within a synchronous environment. Thus the CMC based synchronous tools play an important role within a DL environment.

As the majority of the courses evaluated under this research utilizes Horizon Wimba as a CMC based synchronous tool, this section explores the major characteristics of CMC

based synchronous DL tools giving specific references to the Horizon Wimba, with the intention of capturing common functionalities. As Keraminiyage et al (2006) highlighted, Horizon Wimba is a web conferencing system, capable of establishing video and audio based communications between the tutor and the learner. Out of the functionalities available, it uses the voice transfer, application transfer and chatting facilities to 'transact' synchronous lectures.

One of the problems both tutors and learners encounter in utilising web conferencing is the time that it takes to learn the various functionalities of the tool. With regard to that problem, a good practice can be highlighted at SCPM where the students are invited to participate at free tutorial sessions before their actual online lectures commence to overcome their fears of using the technology (Ingirige et al, 2005). Among the problems of this software it is often pointed out various connectivity problems due to the nature of local internet connectivity. For example, applications such as Microsoft PowerPoint slides are transferred at a relatively slower pace than voice, so that some students complain that the commentary does not run concurrently with the particular slide in question thereby highlighting problems relating to synchronicity (Ingirige et al, 2005). Therefore it is important to look at this issue from a social perspective, to safeguard the equal opportunities of learning available to all the students in question. It may be down to the application developers to look at low and high bandwidth availability issues at the user end within CMC based DL tools.

In addition to "Horizonmiba"; "click to meet", Macromedia (Adobe) Breeze Live and iConfer are some other CMC synchronous DL tools which share similar functionalities and characteristics.

2.2.4 Commercial Vs Open source tools

Different functionality requirements, available infrastructures and basic individuality of DL courses attract different products for launching internet based DL courses. Two major streams of selections are in practice in today's context. One approach is to purchase off-the-shelf commercial products which provide extensive technical support in terms of configuration and maintenance. This includes software such as Horizonwimba and Blackboard. However, it is often pointed out that the features available within these commercial packages are generic and have problems to address the specific needs of tutors and students of a particular course (Ingirige et al, 2005). And it is arguable whether all the features available within these packages can really add value to DL courses. Further, these tools come with a big price tag attached, preventing some organisations to consider using these tools within their DL environments.

On the other hand, there is a trend to develop custom VLE applications based on open source projects like Modular Object-Oriented Dynamic Learning Environment (MOODLE - www.moodle.com) and Bodington (www.bodington.org). Even though these software help in saving on licensing fees, it does not mean that the organization can host an internet based DL course without any expense. Even though often open source projects have support systems based on user communities, often those projects lack official support systems. Further, the cost of implementing these open source software based VLEs has to consider in connection with the other associated costs like staff training, in house technical expertise, etc. Moreover, it has been noted that most of the open source DL tools are asynchronous, and synchronous open source DL tools are rare compared to that of asynchronous tools.

2.3 Synthesis

The theories discussed in the previous section and the various tools discussed in this section reveal that advances in communication technology has rendered the structural constraint of distance a relatively minor design challenge. For example some of the students registered for SCPM's DL masters courses are from different parts of the globe belonging to different time zones. However, transactional aspects of learning equally

need to be addressed within these tools. For instance Salmon (2000) stated that e-moderation by tutors can be utilised as an intervention to enhance the active interaction between tutors and learners. Despite its identified importance, still not much significance has been assigned within these tools to improve the transactional aspects of distance learning. Especially, there is minimal attention given so far within these tools to cater for the social needs of learning such as guidance and support, body language, feedback, interactions with other learners etc,

Moreover, as the case in SCPM, it may be a necessity to utilise synchronous and asynchronous tools simultaneously to deliver DL courses. This is due to the fact that, use of synchronous tools alone reduces the flexibility of the DL settings. As an example, a student who is working within the construction industry may wish to follow a DL course, but if the course only follows a synchronous DL mode, the potential student might find it difficult to follow it at his or her own free time, which defeats the whole purpose of DL as earlier pointed out (see section 2.2). Further, if the potential student is belongs to a country which belongs to a different time zone, the lecture sessions hosted using synchronous modes may not be conveniently accessible to the student. Therefore SCPM maintains an optimum balance between the synchronous and asynchronous tools used taking several factors into consideration. This optimum balance, however, varies between institutions based on the context in which they utilise the various tools. This is the basis on which we propose guidelines to enhance social outcomes in distance learning.

Thus, this research has been carried out to cater for this need, with the identified aims and objectives as demonstrated within the next section of the report.

3 Original aims, objectives, outcomes and benefits

3.1 Aim, objectives and anticipated outcomes

The overall aim of this project is to improve social outcomes within SCPM DL settings pertaining to existing DL Masters and PhD programmes and to share results with other schools and faculties. In order to achieve this aim, the project is guided through the following objectives. The objectives are:

- To identify the currently available tools for DL, both synchronous and asynchronous;
- To formulate a methodology for eliciting the social dimensions of the collaborative tools in practice;
- To identify gaps within the available tools for effective and efficient knowledge transfer and ;
- To recommend appropriate guidelines for improvement both in terms of collaborative tools as well as facilitator interventions

3.2 Benefits envisaged

The following outcomes and benefits are envisaged from this project:

- Improvement in the quality of distance learning facilitation across SCPM's DL Masters and PhD programmes by addressing the social dimension of distance learning tools.
- Enhanced student learning experience through better facilitator support and feedback
- Good practice guidelines for improvement of distance learning tools
- Transferability both within the university and on a broader scale.

4 Course and programme details

The project was led by the School of Construction and Property Management (SCPM). Giving particular emphasis to distance learning, the school has two major courses within the postgraduate setting.

1. The MSc distance learning programmes
2. The PhD distance learning programme

SCPM currently conducts eight distance learning Masters programmes. The research project focused on three of these programmes to study the pedagogical aspects of DL tools, modes of deliveries and relevant experiences. The Programme Leaders of the three Masters Programmes were interviewed to gather data on their relevant Masters programmes. The Masters level programmes were in different stages of maturity. Table 1 provides a comparison of the main highlights of the three Masters programmes. (Their individual names have not been disclosed)

Table 1 - Comparison of three Masters programmes at SCPM (adapted from Ingirige and Goulding, 2006)

Question Heading	MSc 1	MSc 2	MSc3
Number of years since commencement	> 8 years	2 – 3 years	2 years
Method of course delivery	Face-to-face class room and distance learning	Distance learning	Distance learning
Size of cohort	12	10	40 (intake every year)
Technology used for distance learning	Asynchronous - Blackboard	Asynchronous – Blackboard Synchronous – Horizonwimba for online tutorials	Asynchronous – Blackboard Synchronous – online discussion forums via an off the shelf package

The school utilises a variety of web based technologies for DL and recently invested heavily on software and other infrastructure. MSc1 and MSc2 utilises horizonwimba – live classroom (<http://www.horizonwimba.com>). MSc3, utilises an off-the-shelf package that can facilitate electronic discussion forums. Blackboard Virtual Learning Environments was utilised across all three programmes. The Blackboard VLE performed the function of a portal to host the lecture notes and coursework briefs. The DL students submit the courseworks utilising different forms of submission techniques. In the MSc 1, the students were required to use the digital drop box function of Blackboard VLE to submit their main coursework. In addition, the students undertook a time constrained essay administered via blackboard. The students were also assessed through a set of MCQ questions, online via Blackboard. The tutor sets the MCQ questions utilising the functionality available within Blackboard VLE and each of the students get a random set

of ten MCQ questions, and they are assessed automatically by the system. MSc2 conducts monthly online synchronous tutorials utilising Horizonwimba and formative feedback is provided during these sessions on different aspects of the module's themes. MSc3 utilises the off-the-shelf software package to facilitate a weekly discussion forum among the students for formative feedback purposes. The content of the programmes are related, wherever possible, to real industry situations and professional practice whilst developing key academic knowledge and critical skills.

Out of the three Masters programmes, MSc2 and MSc3 utilised their IT based tools to create online synchronous socialisation between the co-learners and the tutors. MSc2, for example, conducted frequent online tutorials in which the participants were able to share their thoughts on a particular aspect of the group activity through the live classroom in Horizonwimba. MSc3 on the other hand conducted their co-learner activity through an electronic discussion forum every week. The students also conducted breakout sessions via this tool.

In addition to the three programme leaders of the SCPM DL Masters programmes, two e-Learning experts at University of Salford were interviewed to gain perspectives of distance learning environments and co-learner interactions. These experts contributed across various programmes on how to improve effectiveness and efficiency of online tools across various schools and faculties of the University of Salford.

As the benefits of this research project are expected to be disseminated outside the SCPM boundaries, several other distance learning programmes were evaluated under this research, across Europe. These courses are;

1. University of Liverpool: This online programme performs a support function to the Medical and Healthcare Faculty students. E.g. how to reference in academic reports
2. London School of Economics (LSE): Collaborative teaching of the French Language between the Language Centre, The London School of Economics (lead), University of Columbia, USA, Paris Dauphine, France.
3. University of Maribor, Slovenia: An International Masters Programme titled "ITC Euromasters", a collaborative project between nine Universities.

These programmes use different distance learning tools within different environments, providing a rich comparative basis. Out of these courses, the ITC Euromasters course in Slovenia has been evaluated as a case study for this research (see appendix for the case study report).

5 Description of activities and evaluation of results

This section summarises the results of the major activities undertaken during the project:

- A review of currently available distance learning tools, largely through a literature survey and a web search
- A series of interviews conducted with identified parties who are using various distance learning tools to elicit the problems of the tools associated with the social aspects of distance learning
- A case study to identify the methodologies and good / bad practices of using distance learning tools and associated social issues. The student and tutor perspectives were studied extensively within this case study.
- Dissemination of the project outcomes

5.1 Methodology and management

5.1.1 Project management and evaluation team

The project team comprised of members of the School of Construction and Property Management's (SCPM) academic team, including those closely associated with the management and implementation of the distance learning courses.

Project Leader: Dr Bingunath Ingirige – Lecturer, SCPM

Academic Investigators: Dr Dilanthi Amaratunga – Senior Lecturer, SCPM

David Baldry – Associate Head of Teaching, SCPM

Prof. Martin Sexton – Senior Lecturer, SCPM

Dr. Vian Ahmed - Programme Director, PhD (MERIT) programme, SCPM

Prof. Ghassan Aouad - Dean, Faculty of Business and Informatics

Researcher: Kaushal Keraminiyage – Graduate Teaching Assistant, SCPM

5.1.2 Methodology

The research was carried in three stages, as Figure 1 illustrates. The initial literature review is employed with the intention of identifying the current available DL tools and their functionalities. This represents as the stage 1. However, the literature review was continued throughout as a means of keeping this research up to date with the developments in the field. At the second stage, the initial interviews were conducted to identify the gaps within existing DL tools that either promote or hinder the social dimension of learning. At the third the identified tools were evaluated in terms of their functionalities to elicit their potential social dimensions using the secondary interviews and the case study. Further to this major function, it has been identified from the case study, further gaps of current DL tools in terms of addressing social issues of learning. The gap identification and elicitation of social dimensions from the current DL tools were compared against DL scenarios in the context of various institutions in the UK and in the

case study in Slovenia. With the outcomes of these a set of good practice guideline were compiled on how to use the current DL tools to maximise social aspects of learning within DL settings. The outcomes were disseminated through various channels.

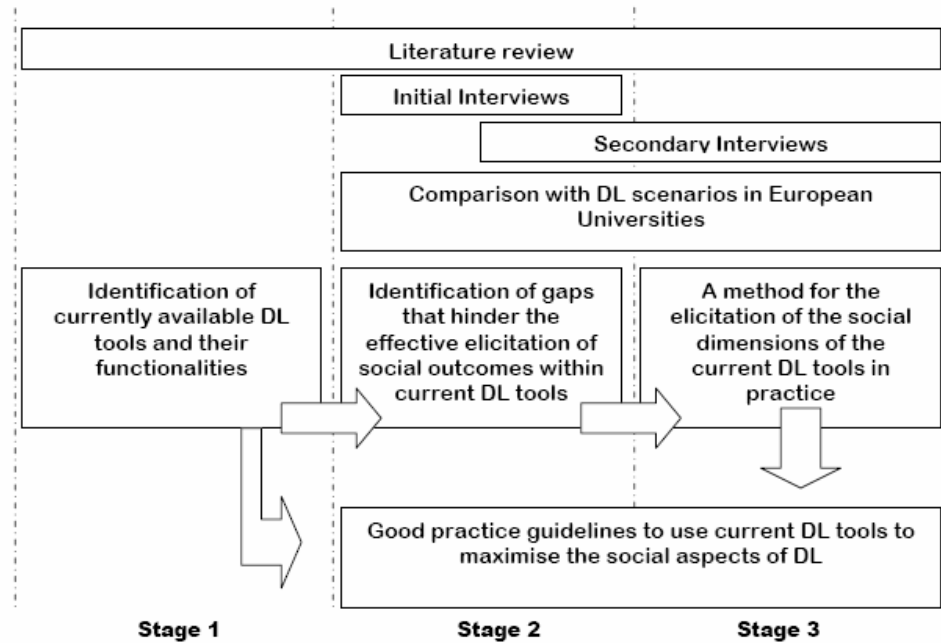


Figure 1 - The project's research methodology

5.2 Outcomes

5.2.1 A review of current distance learning tools

As identified within the section 2.2 above, the literature related to DL identifies various CMC tools and various characteristics attached to these tools. This section provides a comparison of four popular distance learning tools. The tools in comparison are Blackboard, Moodle, Horizonwimba (live classroom), Macromedia (Adobe) Breeze Live. These four tools have been selected and compared within this section as these tools are either being used or is being considered for the future use within the organisations studied under this research.

Table 2 – Comparison of online tools utilised in the DL context

	Blackboard	Moodle	Macromedia (Adobe)Breeze Live	Horizonwimba – Live Classroom
Tool classification				
Synchronous (Please refer section 2.2 for details)			X	X
Asynchronous (Please refer section 2.2 for details)	X	X		
Commercial (Please refer paragraph 2.2.4 for more details)	X		X	X
Open source (Please refer paragraph 2.2.4 for more details)		X		
Licensing mode	Per product	General Public Licensing	Per product or as a hosted service	Per user
Information Services				
Online announcement services (Please refer paragraph 2.2.2 for more details)	X	X		
Course calendars	X	X		
Communication Services				
Text based chat services	X	X		
Discussion Forums	X	X		
Webcams (Video)			X	X

Audio communication channels			X	X* (Disabled when web cams are active)
Online presentations			X	X
Live interactions			X	X
Assessment Services				
Online assessments (MCQs, Surveys, etc.)	X	X	X	This tool can be used to assess online student presentations – live
Online grading methods (e.g. “Grade book”) (Please refer paragraph 2.2.2 for more details)	X	X	X	
Content Management Services				
File repositories	X	X		
Student assignment submission tools (e.g. “Digital Drop box”) (Please refer paragraph 2.2.2 for more details)	X	X		
Other				
Special Characteristics related to social aspects	Use of Blackboard Virtual Classroom E-Moderation		Breeze is not predominantly a VLE tool, rather it is a general web conferencing tool with the potential of being used as a synchronous DL tool. Thus, may need special consideration of social issues at the end user end, if intended to be used as a DL tool.	<p>The tutor can obtain online feedback, tutor can disconnect disruptive students</p> <p>Student participation on whiteboard canvass</p> <p>Use voting tool for feedback</p> <p>Web cam, voice transfer not possible at the same time</p>

The comparison presented above based on several characteristics identified through the literature review. Where appropriate, references were made to the relevant sections of report. However, some characteristics compared above need further elaboration and are provided below.

5.2.1.1 *Licensing mode*

As often software programmes form an intellectual property, they are issues to the public under various licensing modes. Broadly these modes can be divided in to two categories, namely, the General Public Licences (GPL see <http://www.gnu.org/copyleft/gpl.html>) and Commercial Licences. Within the CMC based DL tools, these two licensing modes represent, in general, the open source and commercial tools (see the section 2.2.4). However, as CMC based DL tools often accommodate more than one end user (students and tutors) at a given time, the licensing mode can take the form of licence per product (any number of simultaneous users) or licence per user (each user will need separate licence to use the product).

5.2.1.2 *Text based chat services*

Within this service, the students and tutors can communicate with other students and / or tutors in a “near live” manner. The sender can type the message in a special text box on his or her browser and the recipient can see the posted message almost instantly based on the technology used.

5.2.1.3 *Discussion forums*

These are generally used to create discussions / debates (private or public) about various topics, within online communities. With specific reference to CMC based DL tools, discussion forums are used within student communities to create discussions about day to day learning activities and other related issues. Further, these are also being used as a medium for student – tutor discussions.

5.2.1.4 *Webcams*

These are used extensively in modern web based conference tools, to visually communicate with the parties geographically apart. Within DL settings often synchronous DL tools are equipped with this facility to create a visual communication channel between the students and the tutor. The successes of these are generally bandwidth dependant, making it difficult to use to communicate within narrow band internet users.

5.2.1.5 *Audio communication channels*

As with the webcams, audio communication channels are also a major mode of communication within web based conferences. These channels help establishing a live voice communication channel between two or more parties geographically apart. Some synchronous CMC based DL tools use this technology to establish a live voice conversation between the tutor and the students mimicking the natural way of communication in a conventional classroom setting.

5.2.1.6 *Online presentations*

Some web based conference tools are capable of integrating presentation tools such as Microsoft PowerPoint in the conference. Within some synchronous CMC based DL tools, this feature is extensively used to deliver online lectures.

5.2.1.7 *Live interactions*

Some multi user computer applications allow multiple users to interact with the programme simultaneously even from different work stations. Using this technology, some of the CMC based DL tools (especially within a synchronous setting) allow students to interact with the tutors during a lecture or a lesson.

5.2.1.8 Online assessments

Some CMC based DL tools provide the functionality of conducting online assessments replicating the traditional examinations in a conventional class room setting. These assessments may have different modes from multiple choice questions to detailed essay type questions. Accordingly, various tools have in varying degrees, inbuilt automated marking and feedback systems.

5.2.1.9 File Repositories

These are online digital storages, where files are often stored securely and systematically by users for sharing and archival purposes. In CMC based DL tools file repositories are used generally in asynchronous modes, by tutors to share learning material with students and peer colleagues.

5.3 Current use of DL tools and social aspects of Distance Learning

This section details some of the empirical findings as a result of field research. The main lines of inquiry was on the use of DL tools and their capability to address the social aspects.

5.3.1 Initial Interviews

As introduced in Figure 1 initial interviews were conducted with five online learning experts at Salford (three programme leaders of SCPM DL Masters programmes and two online learning experts). During the next stage, the interview process was more broadbased and other interviews and case studies were conducted with DL tutors in other leading institutions in the UK and overseas.

5.3.2 Analysis of Initial Interviews

The SCPM DL Masters program leaders (PLs) argued that the rationale for delivering the courses via the DL mode is due to the specific nature of demand in the construction industry for DL courses. The majority of the learners are employed in the industry and they are unable to follow face-to-face class room based courses and the DL philosophy of studying at the learners own pace and time is totally aligned with their work commitments. The PLs were concerned whether too many online synchronous content within a DL course would work against this philosophy of DL. For example, one PL stated:

“I am yet to see a distance learning course being delivered totally utilising the synchronous tools. What we have here is a distance learning course that has a synchronous element in it to conduct live tutorials”

The other programme leaders also agreed that the success of the school's rapid growth in distance learning Masters programmes is due to the flexible learning environments. Therefore too many synchronous lectures might constrain participation and reduce demand in the long run, hence, finding an appropriate balance among synchronous tools is important (See Ingirige and Goulding, 2006). Within the SCPM DL courses, we found specific nuances such as DL programmes targeted at special needs students, which needs addressing of specific accessibility requirements. For example, the particular programme leader identified that utilising web based synchronous software for voice transfer, was not appropriate as a tool in this programme due to the special needs students in the cohort.

The importance of both synchronous and asynchronous elements of distance learning was emphasised during the interviews with the e-learning experts. The utility of 'blackboard VLE, MOODLE and horizonwimba was highlighted by the interviewees as contributing towards the total delivery of a course. Therefore the decision on synchronous and asynchronous modes should be based on the primary motive of online learning and depends whether the tools are utilised to facilitate a 100% distance learning programme or as a supplement to an actual classroom session. However, the current decision making on the use of online tools is not well thought through. For example, one of the interviewees lamented that the usage of the elements of synchronous and asynchronous within a DL environment is decided on the basis of convenience by the tutors rather than fulfilling a strategic purpose. The interviewees emphasised the importance of e-moderation (Salmon, 2000) of electronic discussion forums as a major intervention in using blackboard for the benefit of the learners and to enhance their learning experience. This intervention according to the interviewees contributed significantly towards overcoming the feel of isolation among the students and contributes towards generating more valued discussion and debate.

The above initial interviews were compared with the interviews with other key stakeholders in DL programmes in the UK.

5.3.3 Analysis of Interviews conducted with Other DL facilitators in the UK

DL tutors in two other higher education institutions in the UK were interviewed during this stage. Both interviewees represented the languages unit of the institutes performing a support function to the core faculties. Although they were from similar support units in the two HE institutions, the DL tools that they utilised performed two different functions. As a result, two different types of DL tools were used to perform the functionalities. At the London School of Economics (LSE), Language centre, the tutor utilised the voice tools capability of Horizonwimba to enhance the tutorials conducted through electronic discussion forums on an asynchronous basis. The DL tutor from University of Liverpool used the live classroom session for a series of lectures on referencing to various schools and faculties. These lectures were archived, so that the students could participate and benefit from the knowledge and experience continuously during a semester.

Online synchronous lectures were not appropriate in the case of the first DL situation (at the LSE) as the French classes were time tabled differently in the three collaborative universities. They also faced time zone problems in delivering synchronous lectures between the London School of Economics, UK, Paris Dauphine, France and University of Columbia, USA. But the asynchronous voice tools enhanced the speed at which the lessons were delivered and it also helped in the assessment process. Earlier the students had to record short audio clips on CD's and send them physically and via email to the addresses of the three institutes to transfer the audio clips. The voice tools facility of horizonwimba enables the recording of the short clips and posts them as audio clips on the horizonwimba voice board (see Figure 2 for an extract of horizonwimba voice board on WebCT). The use of horizonwimba voice tools encouraged more student participation as well as provided the opportunity for the tutors to give quick feedback to the learners.

Topic	Unread	Total	Status
Main	1	10	public, unlocked
Les animations de Michel Herrera	1	26	public, unlocked
OgreNG	7	16	public, unlocked
Break cake	2	4	public, unlocked
Pour ou contre les graffitis ?	0	9	public, unlocked
La langue de bois	0	1	public, unlocked
Les altermondialistes sont-ils utopistes ?	5	11	public, unlocked
altermondialisation : une ombre, une illusion ou un projet bénéfique ?	0	10	public, unlocked
AMR: Modèle de mini CV/ Etudiant X	1	2	public, unlocked
AMR : Mini CV de Chris	0	9	public, unlocked
AMR : Mini CV de Malcolm	0	6	public, unlocked
AMR : mini CV d'Ariel	1	6	public, unlocked
AMR : mini CV de Niah	1	7	public, unlocked
AMR : mini CV de Nina	0	1	public, unlocked
AIDONS MALCOLM !	0	2	private, unlocked
AIDONS CHRIS !	1	1	private, unlocked
AIDONS NAIH !	0	0	private, unlocked
AIDONS ARIEL !	0	1	private, unlocked
All	20	122	---

Figure 2 - Horizon wimba voice tools on WebCT (Adapted from LSE presentation)

The online synchronous lectures at the Liverpool University were facilitated with the use of Live classroom functionality of Horizon Wimba. They utilised the tool as part of a blended learning approach to enhance the student learning experience. The concept was started to address the issue of few students who had to travel long distances to attend the tutorial sessions. They identified key skill areas that they wanted to address through distance learning techniques. One such area is how to do referencing and how to use referencing software. As such, several online synchronous lectures were conducted about referencing and plagiarism and made them available online. These lectures were conducted to the first year students in health sciences and first & second year medical students. The take up from the first year healthcare students was not significantly high but the medical students participated well. Liverpool University in this programme were using distance learning as a support tool for the programmes but not as a single delivery mode for a module or a course.

The two interviews indicate the justification of the synchronous and asynchronous tools based on the DL context. The next section deals with a detailed case study of a European HE institute and their delivery of a DL programme.

5.4 Case Study

The team leader received funding as part of the initial revised proposal (as proposed by EDU memo) under the EU Leonardo scheme organised by the Northwest Universities Association in Manchester. This funding was utilised to conduct a detailed case study of a distance learning course at the IT Centre, Faculty of Civil Engineering, University of Maribor, Slovenia under the one week staff exchange programme

Information Technology in Construction (ITC) Euromasters is an international Distance Learning Programme, involving nine universities. The DL programme was started in 2001 with the aim of developing an interuniversity postgraduate program in ITC. The program with the initial curriculum started in the academic year 2004/2005 on two partner universities, but has later evolved to a more flexible form of ITC Course Pool involving nine universities. The main tool utilised for delivering the online DL programme by the various institutions is the ITC Portal, which has been created based on MOODLE. This portal hosts all the teaching materials and an asynchronous discussion forum. Weekly tutorials under the synchronous mode are conducted via 'click to meet'. Apart from these formal mechanisms the tutors and the learners use 'skype' and 'MSN messenger' for conferencing purposes.

This case study enabled us to understand the way in which the DL course was packaged under an international course pool context. The DL tools utilised by the tutors in the programme were appropriate with the context and wider alignment was observed between the learning outcomes (e.g. addressing problem based scenarios, group based decisions), assessment methods (group projects, online oral presentations facilitated by web cam support) and delivery methods (ITC portal, synchronous and asynchronous tools). Due to the availability of the ITC course pool, there was wider choice of modules for the students and they were able to gain the requisite competence based on their professional work.

Interviews with SCPM, LSE, Liverpool and the Slovenian case study indicate the various DL contexts that drive the utilisation of tools, tutor and learner interactions and interventions. The results influence the preparation of the guideline for improving social outcomes within distance learning. Figure 3 indicates examples from our empirical study that informs the preparation of the guidelines. This is further extended under the Guidelines compendium document.

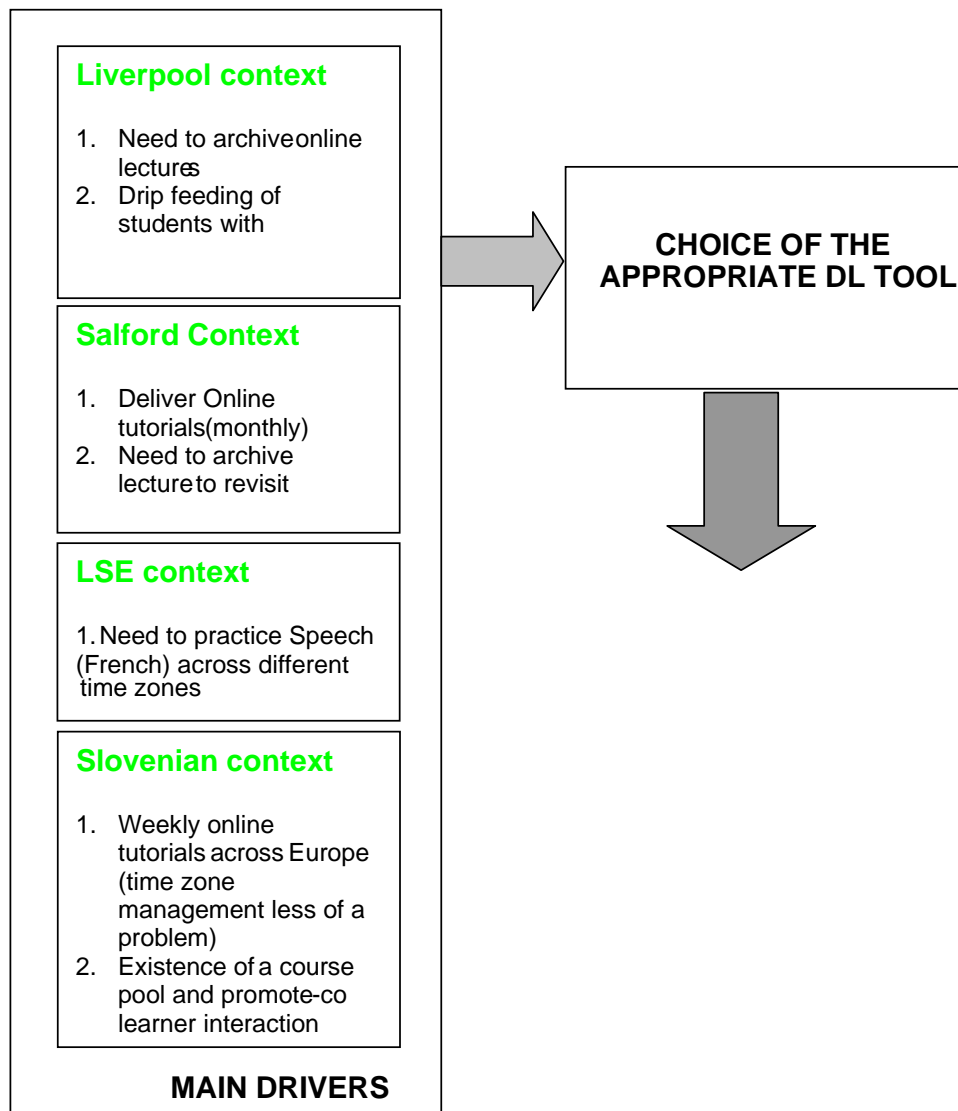


Figure 3 - Main drivers for DL settings - empirical evidence

5.5 Dissemination

Dissemination of the project outcomes is ongoing. The following summarises both prior and planned dissemination activities.

5.5.1 Dissemination activities undertaken to date

- A set of good practice guidelines for using distance learning tools to elicit the social aspects of Distance Learning have been written that describe a range of practices adopted across different Universities and disciplines. The guidelines are based on the literature review, pilot interviews and the case study undertaken as part of the project. These are attached to the report as appendix 1
- A paper was presented and published in the proceedings of COBRA 2005: The construction research conference of the RICS Foundation (July 2005), Queensland University of Technology, Australia. The paper discussed the research problem in detail within a detailed literature review along with a strong justification for the research need. (Ingirige et al 2005)
- A paper was presented and published in the proceedings of the 3rd Education in a Changing Environment conference (January, 2006), University of Salford. It discussed the distance learning environment and distance learning tools used within a UK based higher education institution with the aim of identifying how this environment favour / distract the social outcomes of distance learning. (see reference Keraminiyage et al 2005)
- A paper was presented and published in the proceedings of the BEAR 2006 (April, 2006), The conference relates to Built Environment Education and Research and was held at the Kowloon Shangri-la hotel, Hong Kong. It discussed the primary interview outcomes. (see: reference Keraminiyage et al 2006)
- A journal article titled “distance learning paradigm: can delivery and assessment tools really compensate for lack of face-to-face contact?” was submitted to the Architectural Engineering Design Management Journal and it is currently being peer reviewed (see reference Ingirige and Goulding, 2006)

5.5.2 Planned dissemination activities

- There will be a journal paper titled Distance learning tools: the importance of social issues in learning (provisionally, the Journal of Teaching and Learning in Higher Education).
- A case study will be submitted to the Centre for Education in the Built Environment's (CEBE) case study series for dissemination among University Built Environment departments.
- The Guidelines for social outcomes gained through DL tools document will be disseminated to other schools and faculties at University of Salford via the EDU website.

6 Developments and transferability

6.1 Consideration of how the project has developed and discussion of less successful elements of the project

The project has shown considerable development moving from its original state at the bid stage to the stage where we have produced the guidelines for improving social outcomes in DL tools. During the course of the project, we broadened the scope of the empirical investigation moving from the SCPM to other schools and faculties in the UK. In addition, we utilised EU Leonardo Funding to do a detailed case study of an international DL programme with the principal partner in Maribor, Slovenia. The broadening of the study to other institutions enabled us to develop collaborative links with various interest groups and we endeavour to establish such progressive links in the future. In terms of publications, this project has produced three conference papers and one journal article (under review). Further, conference and journal articles and other publications are planned as indicated in Section 5.5.

Considering the current and future commitments on DL courses at SCPM and other construction faculties in the UK and beyond, the findings of this study is rated highly significant and influencing SCPM strategy in this area. The TLQIS project was instrumental in initially gathering the critical mass in the area by involving the programme leaders in the various Masters DL programmes and eLearning experts at SCPM to address the delivery methods and associated social outcomes.

An important goal of the project was to identify various DL contexts within the construction industry and investigate how the delivery methods are appropriately aligned with the particular context. The findings provided us with examples of how this is done in construction related courses (SCPM and Slovenia) and other language courses (Liverpool and LSE). However, due to the time limitations in the project we were only able to gain the perspectives of learners at the University of Maribor in Slovenia. The overall perspective on social outcomes would have enriched with a more balanced view of tutors and learners. As we have started this debate on improving social outcomes of DL courses within SCPM, we propose an extended action research approach among MSc DL programme leaders and PhD Distance Learning facilitators to take forward this initiative of improving social outcomes of distance learning tools within SCPM.

6.2 Transferability

The main part of the project was to understand the importance of social outcomes in DL programmes at SCPM and other institutions conducting DL programmes. The delivery tools and methods were found to be context dependent and this context could differ even between two different DL programmes within the same school depending on the situation of the learners. For example, at SCPM the MSc3 consisted of learners with special needs as such a synchronous IT based tool such as horizonwimba might not be appropriate. Within the context of the LSE DL programme, one of the factors that influence the tool utilisation is the issue of managing different time zones between UK, France and USA. This situation justifies the use of asynchronous wimba voice board. The guidelines proposed as an outcome of this project have been written to address specific issues and nuances across programmes, schools and faculties and be made transferable across DL programmes. This finding influences the design of Masters programmes in the future and each new DL programme will be evaluated in terms of

student numbers, their backgrounds, time zones and their specific requirements and relevant tutor experience and their capability in designing the synchronous / asynchronous tools for DL course delivery. In addition, the pedagogic requirements such as learning outcomes, assessment strategies will also influence delivery methods and the degree to which various social aspects are going to be integrated within the DL delivery package.

7 Reflection and conclusion

Distance learning is an important area within SCPM's teaching portfolio. Currently, SCPM has eight Masters Distance Learning Programmes and evaluating more programmes to be launched in the near future. Among other factors, we consider the various business opportunities brought about in education due to the booming construction industry in determining new courses or programmes. The main attraction for our Masters Distance Learning Programmes is the flexibility the students have in undertaking the learning process without disrupting their work commitments in their professional construction field. This is a major factor which influences our decision on deciding the appropriate mix of synchronous and asynchronous delivery tools.

The results of this study indicate a strong contextual dependent design and delivery process for DL education. The improving of social outcomes should be aligned with a particular context. For example, in a situation where special needs students exist, a synchronous online collaborating tool might not be appropriate although the IT capability can bring in near face-to-face outcomes. We initially studied three Masters programmes within SCPM to investigate the various tools utilised, methods of assessments, student number and their backgrounds and their degree of participation in the programme. We then investigated other DL courses in the UK and internationally to gain a broader understanding of DL programmes, the overall tools that they use and the various social outcomes gained through these tools.

The investment on distance learning tools and various associated hardware and software is bound to increase in the UK and this study presented some of the state of the art developments that have taken place in the field. Although DL has spread widely into courses in language related disciplines they are also being embraced by other fields such as medicine and science where a more blended learning approach is emphasised. In the construction field, SCPM has pioneered some of the Masters Programmes and invested on some of the tools and other technical and human resources due to the importance given to the area, within the portfolio of its courses. The guidelines for improving social outcomes, which are aligned with the particular context can shape some of the future investment in the area. Results also suggest various improvements that can be made to the existing tools, which need to be done in association with software developers. These developments will impact the teaching styles of tutors and the learning styles of learners.

On a wider scale, we as tutors in the various DL programmes are being made aware of the changing role of the teacher (see Forsyth, 1998) within the context of web based DL from a teacher to a facilitator. However, a lot of time allocation is needed for some of the tasks such as being a moderator of discussion forums etc. training of learners for specific distance learning courses and facilitators of synchronous lectures. For instance Dunn et al (2004) states that teachers who were committed to DL found that their workloads increasing dramatically when student cohorts increase in size. This we recognise as a lateral enriching of change in scope of our work due to the new role of DL facilitator.

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1 Appendix 1 – Use of DL tools: Case Study of a leading construction faculty in Slovenia

1.1 Background and Context:

Information Technology in Construction (ITC) Euromasters is an international Distance Learning Programme, involving nine universities. The DL programme was started in 2001 with the aim of developing an interuniversity postgraduate program in ITC. The program with the initial curriculum started in the academic year 2004/2005 on two partner universities, but has later evolved to a more flexible form of ITC Course Pool involving nine universities. The students attend the courses in virtual classrooms, where they meet with their tutors from the various institutes. The program has been developed with the purpose that students will not only get the best subjects the partner universities can offer in their specific areas, but will also get the very important experience of other universities and teachers, fellow students and cultures, as well as of using IT in collaborative learning and working process.

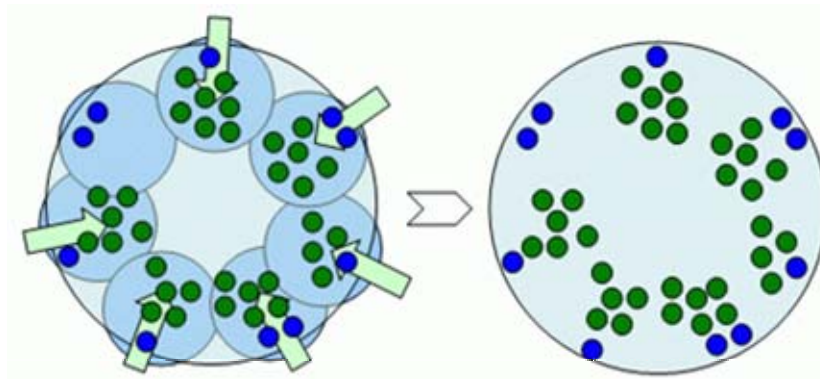


Figure 1: The transformation due to the International DL course (Source: <http://euromaster.itcedu.net/>)

The transformation of a multiple input - multiple class into a single virtual class is one of the phenomena of the multi-university multipoint distant learning provided by this DL concept. (see Figure 1 - small circles represent students and teachers, middle circles represent partner universities, and the big circles represent the common programme and the virtual class).

To overcome formal obstacles in accreditation of a uniform curriculum and to open the ITC postgraduate program to the global community the course adopts an open pool of ITC related courses. The first university that developed their own program using subjects from the ITC Course Pool was University College Cork with the Master of Engineering Science - Information Technology in AEC program starting in 2007/08.

Currently the following courses are officially offered in the ITC Course Pool:

Data modelling in AEC	University of Maribor, Slovenia
Mobile computing in Construction	University College Cork, University of Maribor
Software Engineering	University College Cork
IT for eBusiness in AEC	University College Cork

Computer Aided Facility Management
Virtual Construction

University College Cork
Lulea University of Technology,
Sweden

The curriculum spans the whole range of ITC, technological and theoretical aspects, models including their functionality and processes including their simulation. The ITC curriculum consists of 12 taught units (subjects) and a dissertation element. These taught units have been developed and are being delivered jointly by the partners of the International DL project. The courses are taught through Internet based distance learning teaching methods.

1.2 Research Questions

The basis of this case study is to raise the following research questions:

1. What DL tools are used for the purposes of synchronous and asynchronous lectures and their appropriateness compared with the particular context.
2. What mechanisms do the tutors use as interventions to create more socialisation between the DL community
3. What are the drawbacks of interventions and tools in practice and what solutions are available.
4. How relevant is the DL concept to be transferred into SCPM and other construction faculties in the UK.

The above questions are addressed through the following methodology.

1.3 Methodology

The modes of data collection for the case study included interviews with tutors, surveys with learners and the study of content and forums in the website portal. Interviews lasting more than an hour were held with the two main tutors (the project coordinator and a module leader) at the institution in Maribor, Slovenia. In addition, three other students participated in a questionnaire survey. The project coordinator also gave exclusive access to the ITC Euromasters (<http://euromaster.itcedu.net/>) portal to study its entire delivery process and specific access to the discussion forums through username and password.

1.4 DL Course Delivery Tools

The project commenced with the ITC Euromasters portal as an asynchronous mechanism for delivering the various modules. However, due to the involvement of several universities and the emergence of the course pool, it was decided that synchronous mediums are essential to improve the student interactions across the various schools and faculties. The partner institutes started utilising 'Microsoft live meeting' tool to conduct online lectures. The major significance of this tool is that when students log in to the webbased virtual classroom, it provides a graphic image of the

classroom, with students filling up the spaces in the classroom represented by graphic icons. During the classroom session, the students' interactions with the tutor are highlighted by the icon changing colour from green to purple.

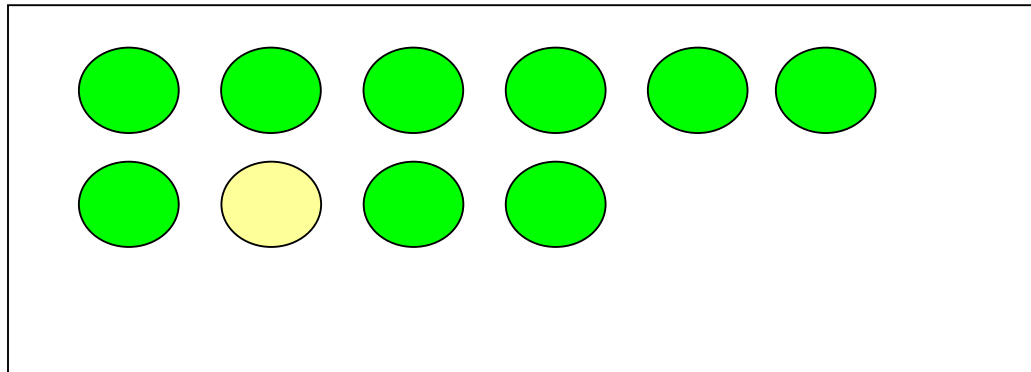


Figure 2: The virtual classroom (Microsoft Live Meeting)

Although the functionality demonstrated in Figure 2 is useful for tutors, the project coordinator was emphasising the lack of webcam support and overall face-to-face contact as limitations of the version they were using at that time. To fulfil this requirement, the project partners trialled a new software known as “see u see me”, which had the webcam support to maintain face-to-face interaction. This product supports file sharing and application sharing, which are core requirements in distance learning. The name of this product changed to “click to meet” (<http://www.radvision.com/>). Since 2004, the tutors have been using this product for conducting web based online tutorials.

The main tool utilised for delivering the online DL programme by the various institutions is the ITC Portal, which has been created based on MOODLE. This portal hosts all the teaching materials and an asynchronous discussion forum. Weekly tutorials under the synchronous mode are conducted via ‘click to meet’. Apart from these formal mechanisms the tutors and the learners use ‘skype’ and ‘MSN messenger’ for conferencing purposes.

1.5 Data Collection and analysis

1.5.1 Interviews with Tutors

‘Click to meet’ is utilised as the formal collaborating tool, whereas ‘skype’ (a voice over IP tool) and ‘MSN Messenger’ (online voice / video transfer and collaborating tool) are the informal means of collaboration. The interviewees argued that the DL students have easy access to ‘skype’ and MSN messenger as they are freely available from the Internet. As a result the students perceive “click to meet” as a tool which does not belong to them and too distant. However the students utilise “click to meet” for application sharing and practicing their presentations for peer review purposes. While an online tutorial is progressing, the ‘click to meet’ window is split to accommodate the video images of the tutors and students. The web cam window of the tutor or the student who speaks occupies the centre of the computer screen, while the others are minimised. This online tool is also used for assessment purposes. Students are assessed based on their written group and individual reports and in some of the modules the students

present online to an audience of co-learners and tutors via “click to meet”. To enable these presentations, the tutors usually handover the controls (referred to as ‘handing over the podium’) to the students. This demonstrates the build up of trust between tutors and learners and enhancing co-learner interactions. When an online tutorial is in progress, all the students switch off the microphone to avoid any audio conflicts and allows the tutor to deliver the lecture. Switching on a microphone triggers the web cam window to maximise and occupy the centre of the screen. Switching on the microphone gives the indication to the tutor of a possible question that a particular student might have relating to the presentation. The students usually adhere to the protocol of giving notice to the tutor of a possible question. This is done utilising the chat facility of ‘click to meet’ and then switching the microphone on to actually ask the question. If there are too many requests, based on the order of entries in the chat area, the tutor will give the opportunity to the students to use the voice facility.

Without the tutors involvement, students communicate using skype and MSN messenger outside the online tutorial times to supplement the lecture notes in the portal and online tutorials. Although several tools were utilised to deliver the lectures The tutors identified the absence of a proper way to gauge student engagement in the lecture as a drawback in the current system. One of the tutors suggested a system administered online feedback questionnaire to be sent to the students while a tutorial is in progress and then translating results to a ‘dashboard’ meter, so that the tutor gets constant feedback on the degree of student interest, engagement in the particular tutorial or lecture.

1.5.2 Survey of students:

A brief questionnaire survey was conducted with three DL students in the first year of their study. Their responses to the questions are given in Table 1.

	Student 1	Student 2	Student 3
What are the reasons for choosing a DL programme	More emphasis on the particular course and calibre of lecturers rather than mode of delivery	Flexibility	Flexibility of managing amidst work commitment. DL was new to me and I thought that I should try it.
Degree of co-learner interaction	Very high	Very high	Very high
Likes and dislikes	Likes: • Lot of flexibility of following lectures Dislikes • Face occasional technical problems	Likes: • Flexibility and ability to cope with the pace of work Dislikes • Due to the lack of face-to-face contact, feel a bit distant with the lecturer	Likes: • Meet people from many parts of the world without having to travel • lectures live "at home", • being the student of nine universities at the same time
Problems	• Voice quality of ‘click to meet’ not as good as ‘skype’ • ‘click to meet’	• Faced sudden disconnection problems • Poor video	• Occasional technical problem due to use of software.

Added functionalities envisaged	<p>does not allow automatic connection between two people when they are connected</p> <ul style="list-style-type: none"> • We use 'click to meet' 'skype' and 'MSN messenger' for different purposes. Its good if there was one application to cover the various functions 	<p>connection problems</p> <ul style="list-style-type: none"> • It is sometimes relatively easy to miss some emails etc from tutors, which can frustrate students a lot. It would be good if electronic documents are better managed..... 	<ul style="list-style-type: none"> • broad e-book library
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The flexibility of the course and the delivery methods were the main drivers for the students to take up this International DL programme. In addition, students also mentioned that the International DL programme has brought them an opportunity of following the courses taught by the best tutors in the field, which would not have been possible under the traditional face-to-face teaching methods. The student perception indicates the overall support for the use of various IT based DL tools. The results also indicated that the student themselves take initiatives to bridge any gaps related to the tools. Most of these gaps perceived by the students are aimed at enabling better co-learner interactions and to prevent isolation among the learners. As stated in Table xx, to offset weaknesses in 'click to meet' the learners conduct online collaborations via 'skype' and 'MSN messenger' to brainstorm ideas for their group project. However, the students expected that in the future, tools such as 'click to meet' will incorporate very good voice quality and video quality as well as enhance connectivity between the learners. Overall, the students expressed their satisfaction towards the DL programme as they were able to interact with students in nine universities contributing to a 'feel of achievement' as being educated concurrently in nine universities.

1.6 Comment on the Research Questions and Reflection

This case study enabled us to understand the way in which the DL course was packaged under an international course pool context. PG students in Slovenia undertaking construction related courses also faced a situation similar to UK where it was difficult for them to follow a day release Masters programme, amidst the various work commitments, which included transiting between construction sites and the need to achieve several project milestones. Instead, students who contemplate in doing postgraduate studies preferred a flexible programme, catered to their needs of following outside office hours and from remote locations. Within this context, the International DL Masters Programme is aligned with the specific requirements of the learners and provides them with the flexibility that they require and the learning outcomes that they want to achieve.

The DL tools utilised by the tutors in the programme were appropriate with the context and wider alignment was observed between the learning outcomes (e.g. addressing problem based scenarios, group based decisions), assessment methods (group projects, online oral presentations facilitated by web cam support) and delivery methods (ITC portal, synchronous and asynchronous tools). Due to the availability of the ITC

course pool, there was wider choice of modules for the students and they were able to gain the requisite competence based on their professional work.

The tutors considered that webcam support provides a very near face-to-face contact between tutors and learners and among co-learners when utilising online synchronous delivery methods for lectures. The number of students in the programme did not cause major problems in having webcam support. As the Masters programme was limited to Europe, the tutors did not face major problems related to time zone management and it was possible to schedule the weekly tutorials to suit the convenience of the students. Both the tutors and the learners also had the flexibility of arranging and splitting the screen for online lectures. This was mainly an operation performed to increase the interactions between tutors and learners in a friendly environment. All the protocols of student participation were designed to enhance student engagement in the programme and to prevent isolation. The learners themselves intervened to utilise various tools such as skype and MSN messenger to bridge the gap between the formal tools.

A few technical difficulties were cited in utilising the online synchronous tools and the ITC portal. However, these technical problems were overcome by tutor involvement and student support. Both tutors and students agreed that they have to work together to overcome any problems or drawbacks in the systems that they use. Both groups agreed that it needs the utilisation of a series of delivery tools targeting various requirements of the learners and a single tool alone cannot provide a comprehensive solution. While recognising the developments that have taken place in the field of distance learning, one of the tutors pointed out that to further improve the outcome of synchronous lectures there needs to be a system whereby the tutor could easily evaluate student engagement in the lecture. In a physical face-to-face classroom session, this will become apparent through body language, questions posed to the lecturer and regular attendance. But the tutor expressed his reservations in determining this engagement in a virtual classroom session, particularly if the number of students is high.

To at least partially remedy this situation, we suggest that there needs to be a short online questionnaire (maximum of 3 questions that require tick box type answers) that needs to be administered online during the synchronous lecture. For example during a one hour session, this could be done three times and the results can be abstracted and translated into a performance chart that indicates student engagement, interest and knowledge gained by the students. The tutor could change his teaching style, methods, voice level etc., based according to the results of the periodic performance chart. In addition to this remedy targeting the synchronous tools, the asynchronous tools can be made efficient by appropriate moderation by the tutors. For example in a discussion forum, the tutors can pose challenging questions to the learners and encourage and energise a debate among the learners. There should also be appropriate integration among the synchronous and the asynchronous tools so that the students and learners can see rationale for the various delivery methods.